# Sprinkler Irrigation Design Summary Worksheet

*Project Owner's Name & Address:*

| Project Location | |
|---|---|
| *Field No:* | *Legal Description:* |
| | _____, Section _____, T_____, R_____; _____ *County, Colorado* |

| Project Designer | | |
|---|---|---|
| *Design Prepared By:* | *Representing: (name of agency, company, etc.)* | *Date:* |

## Basic Soil Data

| Soil Series | % of Irrigated Area | Average Slope, (%) | Available Water Holding Capacity, AWC (in/ft depth) | | | | | Sprinkler Intake Rate, (in/hr) | Depth in feet to | | $EC_{e(ave)}$ (mmhos/cm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0 – 1 | 1 – 2 | 2 - 3 | 3 – 4 | 4 – 5 | | Inhibiting Layer | Water Table | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

$EC_{e(ave)}$ = Average Soil Extract Electrical Conductivity, (mmhos/cm)

## Basic Crop Data

| Crop to be Irrigated | Acres | Root Zone Depth (ft) | Total AWC (in) | MAD (%) | Peak Daily $ET_c$ (in/day) | Net Irrigation Requirement (in / month) | | | | $EC_{e(ct)}$ (mmhos/cm) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

MAD =Management Allowed Depletion
$EC_{e(ct)}$, is the threshold salinity, maximum mean root zone soil salinity at which yield reductions will not occur.

## Irrigation Water Data

| Source | Available Volume (Ac-ft/yr) | Average | | Seasonal Low | | Water Quality | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Flow Rate (gpm) | Pressure (psi) | Flow Rate (gpm) | Pressure (psi) | pH | TDS (mg/l) | $EC_w$ (mmho/cm) | SAR |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

**Sprinkler Design Summary Worksheet, cont.**
*Project Owner's Name:*

## *Irrigation System Planning Data*

Type of System: _____

Total Area Irrigated, **A**, (acres): _____

Crop Evapotranspiration, **ETc**, (inches per day) _____ *(Use peak ETc for the critical design period)*

Actual Operating Time, **T**, (hours/day): _____ *(T is not to exceed 22 hours/day)*

Assumed Application Efficiency, **E$_a$**, (%): _____

Minimum System Capacity, **Q$_u$**, (gpm/acre): _____

$$Q_u = \left[ \frac{453 \cdot ET_c}{T \cdot (E_a/100)} \right]$$

Design Flow Rate, **Q = Q$_u$ x A**, (gpm): _____    Available Flow Rate, (gpm): _____

## *Sprinkler Line Data*

Pipe Description: _____    Inside Diameter, ID, (in): _____

Thickness, (in) _____    Length, (ft): _____    Number of Outlets: _____    Inlet Pressure, (psi) _____

Elev. Head, (ft) Up (-) Down (+) _____ ÷ 2.31 = _____ + Friction Loss, (psi) _____ =Actual Pressure Loss, (psi): _____

Is Allowable Pressure Loss ≤ 20% of sprinkler design operating pressure, (psi)? _____

## *Sprinkler Head Data*    *(for center pivots, show data for the last tower & attach nozzle package design)*

Make: _____    Model: _____    Nozzle Size, (inches): _____

Drop Length, (ft): _____    Nozzle Height, (ft) _____    Pressure Regulators? Y  N    Pressure, (psi) _____

Discharge, (gpm): _____    Wetted Diameter, (ft): _____    Spacing, (ft): _____

Application Time, (hrs): _____    Application Rate, (in/hr): _____

Net Application Depth = Application Time x Application Rate x Efficiency, (inches) = _____

Heerman-Hein Coefficient of Uniformity, CU, as determined from:
(field evaluation)    (model simulation- e.g: CPED)    (design assumption) _____

Estimated Runoff as % of Water Applied, determined from:
(field evaluation)    (model simulation- e.g.: CPNOZZLE)    (design assumption) _____

**Sprinkler Design Summary Worksheet, cont.**

*Project Owner's Name:*

## *Other System Components*

| Item | Location | Description |
|---|---|---|
| Flow Measuring Device | | |
| Surge Control (valve, chamber) | | |
| Air-Vacuum Valves | | |
| Pressure Relief Valves | | |
| Waterline Check Valve | | |
| Injection Line Check Valve | | |
| Drain Facilities | | |
| Other | | |

## Attach Supporting Documentation that includes: *(Check all that apply)*

❑ **Irrigation Water Management Plan, describing:**

   ➢ **Method for determining net annual water requirement and peak daily $ET_c$;**
   ➢ **Method for determining irrigation frequency and application depth;**
   ➢ **Rationale for selected Management Allowed Deficit (MAD) leaching fraction; and**
   ➢ **Describe proposed use for fertigation/chemigation**

❑ **On -site Survey and Soil Investigation Field Notes, as required**

❑ **Well/Pump Performance Test Results & Water Quality Analysis Report** (< 1 year old)

❑ **Filter Selection & Design Computations if required**

❑ **Hydraulic Design Computations & vendor's nozzle package design printout**

❑ **Simulation Model(s) Data**

❑ **Construction Drawings, Specifications, Material List and Itemized Cost Estimate**

## *Attach plan view(s), aerial photo(s), map(s), etc. as needed to identify and locate:*

❑ **Area Irrigated with Sprinklers**
   Include field boundaries, utilities, system layout & direction of move, & prevailing wind direction

❑ **Site Specific Elevation Grid or Contours**
   Include map scale, legend, north arrow & critical elevations, note high & low points on sprinkler line

❑ **Irrigation Well(s) or other Water Source**
   Indicate design capacity (gpm) and operating pressure (psi)

❑ **Delivery Pipeline** (from source to sprinkler line)
   Indicate sizes, lengths, locations, material type, and pressure ratings

❑ **Sprinkler Line(s), Control Station & Filter Station(s) & Valves**